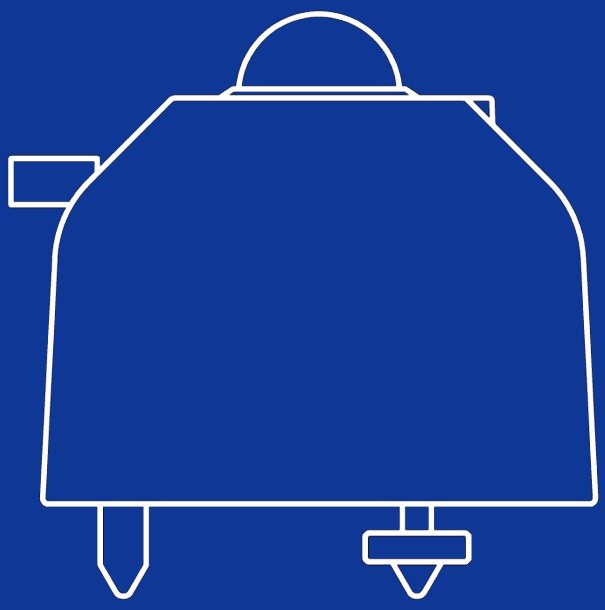
SPECIFICATION

UV-A radiometer
UV-B radiometer

MS-10S
MS-11S



EKO

1. Index

2. Introduction

The MS-10S is an UV radiometer that continuously measures irradiance in the UV-A region (315-400nm), and the MS-11S is in the UV-B region (280-315nm).

The ozone layer absorbs harmful ultraviolet radiation from the sun and plays an important role in protecting human beings and other living things. Recently, it has been confirmed that the ozone layer is decreasing, and this has become a major problem.
UV irradiance is usually divided into three wavelength ranges: UV-A (315-400nm), UV-B (280-315nm), and UV-C (below 280nm). Of these, UV-A light is only slightly absorbed by the ozone layer, so it is not affected by changes in the ozone layer. UV-B light fluctuates greatly depending on the amount of ozone and is harmful to living things, so it is generally referred to as "harmful ultraviolet light.

2-1. Main features

1. Capable of measuring ultraviolet radiation in the UV-A and UV-B spectral region

2. Rainproof structure for constant measurement

3. Multioutput (Modbus RTU, 4-20mA, 0-10mA/0-1V with external 100Ω precision shunt resistor.)
   For MS-10S/11S with the serial numbers listed below allow switching between Modbus RTU and SDI-12 digital output signals.
   MS-10S：UVA22001~UVA22023、EX22234.01~EX22392.02
   MS-11S：UVB22001~UVB22017、EX22166.17~EX22392.05

4. Wide voltage supply input range (5VDC or 8-30VDC)

5. With built-in tilt/roll sensor

3. Specifications

3-1. Specifications

1. UV radiometer Specifications

This product is calibrated to the sunlight spectrum, and is not suitable for measurement of artificial light sources, etc.

Table 3-1. UV radiometer specifications

Item	MS-10S	MS-11S
Measurement range	0 to 150 W/m^2	0 to 10,000 mW/ m^2
Resolution	0.1 (W/m^2)	0.1 (mW/ m^2)
Wavelength range for measurement	315-400nm	280-315nm
Spectral error	< 10%	< 20%
Non-linearity	<1%	
Temperature response	<±1% (-20 to +50°C)	
Cosine response	<±5% (0 to 70°)	
Response time	< 0.2 s	
Viewing angle	2π (sr)	
Operating temperature [1]	-40 to +80°C (Guaranteed accuracy temperature range : -20 to +50°C)	
Leveling accuracy	0.1 °	
Inclination sensor accuracy	<±1°	
Humidity sensor accuracy	±2%RH (Nominal value)	
Temperature sensor accuracy	±0.5°C (Maximum Tolerance)	
Protection class (IP code)	IP67 equivalent (IEC60529, JIS C0920)	
Weight	0.45kg	
Surface treatment	Anodized aluminum (anodic oxidation treatment)	
Output cable (O.D.)	AWG22 0.3mm^2 x 5 cores (φ5.3mm)	
Output cable terminal	Pin terminal (0.3-9.5)	
Output signal [2]	1) Modbus RTU (default) 2) 4-20mA (default) 3) 0-1V (When an external 100Ω precision resistor is used) 4) SDI-12 [3]	
Supply voltage	Operation mode : Voltage Range Modbus : 5Vdc±5% or 8 to 30Vdc±10% 4-20mA : 8 to 30Vdc±10% 0-1V : 8 to 30Vdc±10% SDI-12[3] : 9.6 to 16Vdc	
Recommended load resistance (4-20mA / 0-10mA)	Supply voltage : Recommended load resistance 8 to 15V : 100 to 250Ω 15 to 24V : 250 to 500Ω 24 to 30V : 500Ω	
Power consumption	Operation mode : Power consumption Analog output : < 0.7 W Digital output : < 0.2 W	

[1] When the instrument is used in the ambient temperature exceeding the accuracy assurance temperature range, the measurement error may increase.

[2] Sensor setting can be changed by connecting the sensor to a PC (Use the USB cable (option)) and download the free “Hibi” configurator software from the EKO website.

[3] SDI-12 output is only supported by MS-10S/11S with the following product serial numbers;
MS-10S：UVA22001~UVA22023、EX22234.01~EX22392.02
MS-11S：UVB22001~UVB22017、EX22166.17~EX22392.0

3-2. Dimensions

Table 3-2. Dimensions

	MS-10S / MS-11S
A. Fixing Hole Pitch	65 mm
B. Body Height	73 mm
C. Levelling Screw Height	16 mm
D. Width [including Sun screen/Cover]	Φ96 mm
E. Overall Height [approx.]	101.5mm

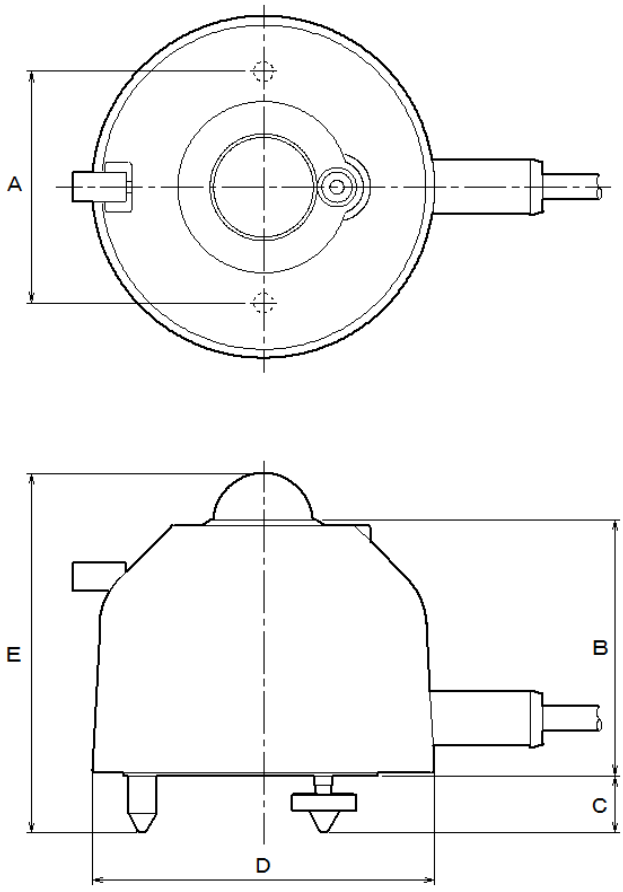


Figure 3-1. External Dimensions

3-3. Output Cables

1. MS-10S / MS-11S

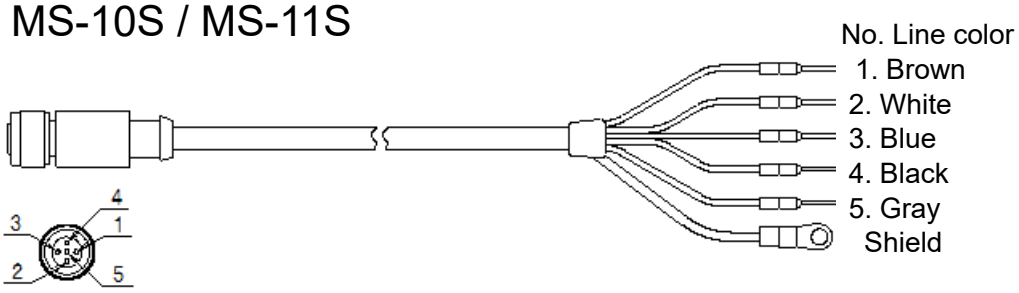


Figure 3-2. Output Cables

Different length (10m standard, 20m / 30m / 50m optional).

Table 3-3. Color Codes of cable

No.	Wire Color	4-20mA	Modbus	0-1V [1]	SDI-12 [2]
1.	Brown (+)	8 to 30VDC (+)	5VDC (+) or 8 to 30VDC (+)	8 to 30VDC (+)	12VDC (+)
2.	White (-)	4~20mA (-) / GND	Vcc GND / RS485 GND	0~10mA (-) / 0-1V (-) / GND	Vcc GND
3.	Blue (+)	---	RS485 (+)	---	SDI-12 Data (+)
4.	Black (+)	---	RS485 (-)	---	---
5.	Gray (+)	4~20mA (+)	---	0~10mA (+) / 0-1V (+)	---
Shield	Shield	FG	FG	FG	FG

[1] When selecting 0-1V output, a precision resistor is required separately.

[2] SDI-12 output is only supported by MS-10S/11S with the following product serial numbers.

MS-10S：UVA22001~UVA22023、EX22234.01~EX22392.02

MS-11S：UVB22001~UVB22017、EX22166.17~EX22392.05

2. EKO Converter Cable（Option）

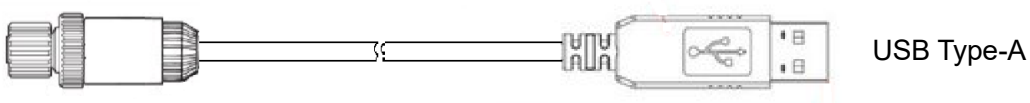


Figure 3-3. EKO Converter cable

4. Standard Items & Accessories

Table 4-1. Package Contents

Contents	MS-10S/11S
UV radiometer	○
Output Cable	○[1]
Sun screen	○
Instruction Manual	Not included in the package. (Please download the manual from the EKO website.)
Setting Report	○
Calibration certificate	○
Temperature dependency report	○
Cosine response report	○
Quick Start Guide	○
Fixing Bolts	[M5] x2 [Bolt Length: 75mm]
Washers	[M5] x4
Nuts	[M5] x2

[1] In case of MS-10S/11S, standard length is 10m for signal/power cable. For different length of cable (e.g. to meet your application needs) please contact EKO or your local distributor.

Table 4-2. Accessories List

Option Items	Description
Output cable [1] [2]	Cable Length: 10m, 20m, 30m, 50m Terminals: Fork Terminals, Round Terminals, Pin Terminals
Ventilation Unit with Heater	MV-01 ventilator and heater
EKO Converter Cable	Converts from RS485 to USB for the communication with MS-10S/11S and allows to connect to PC via USB terminal. Cable Length: 5m

[1] The standard cable length for the MS-80SH is 10 m.

[2] When using the optional cable, a power supply voltage of 24VDC or higher is recommended.

5. Appendix

5-1. Contact Information

EKO INSTRUMENTS CO., LTD.

Asia, Oceania Region

www.eko-instruments.com
info@eko-instruments.com

EKO INSTRUMENTS Co., Ltd.
1-21-8, Hatagaya, Shibuya-ku
Tokyo, 151-0072 Japan

Tel: +81 [3] 3469-6713
Fax: +81 [3] 3469-6719

Europe, Middle East, Africa, South America Region

www.eko-instruments.com
sales-eu@eko-instruments.com

EKO INSTRUMENTS Europe B.V.
Lulofsstraat 55, Unit 28
2521 AL, The Hague, The Netherlands

Tel: +31 [0]703050117

North America Region

www.eko-instruments.com
sales-usa@eko-instruments.com

EKO INSTRUMENTS USA Inc.
2570 North First Street, Suite 200
San Jose, CA 95131 U.S.A.

Tel: +1 408-977-7751
Fax: +1 408-977-7741

5-2. Warranty and Liability

For warranty terms and conditions, please contact EKO Instruments or your distributer for further details.

EKO guarantees that all products have been tested to ensure the instrument meets its published specifications. The product warranty is valid only if the product has been installed and used according to the instructions provided in this operating manual.

In case any manufacturing defect[s] occurs, the defected part[s] will be repaired or replaced under warranty; however, the warranty will not be applicable if:

- Any modification or repair has been done by other than EKO service personnel.
- The damage or defect is caused by disrespecting the specifications published on the Product Sheet or Manual.
- The bubble level fails or stops working (this part will not be serviced or replaced by EKO under warranty)
- There is discoloration of the UV radiometer body, sun shield, and cable within a range that does not affect the function and performance of the product.

5-3. Environment

1. WEEE Directive
[Waste Electrical and Electronic Equipment]

Although this product is not subject to the WEEE Directive 2002/96/EC, please make sure that it should not be disposed of in a landfill or with municipal or household waste. For proper processing, collection and recycling, please contact a specialist collection site or facility.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

5-4. General Warnings

1. Setup

- The installation base or mast should have enough load capacity for the instrument to be mounted. Fix the UV radiometer securely to the base or mast with bolts and nuts; otherwise, the instrument may drop due to a gale or an earthquake, which may lead to unexpected accidents.
- Make sure to install the instrument and cables in a suitable location, and avoid submersion in water.
- Insert the output cable into the connector port on the back of the sensor unit and tighten it all the way. Push the connector in, and check to make sure the screw is tight. If the connection is loose, water can enter the unit and cause it to malfunction.
- When connecting this product to a measuring instrument, the shield wire of the output cable shall be connected to ground earth for the UV radiometer. Otherwise noise may occur in the measurement data. In addition, the surge protection circuit inside the UV radiometer will not operate properly if the shield wire is not connected to ground earth.
- Although this product is tested to meet EMC Directive compliance requirements, it may not fully satisfy its primary specification/performance when using this product near following locations where strong electromagnetic wave is generated. Please pay attention to the installation environment.

  Outdoor: High voltage power line, power receiver/distribution facility, etc.

  Indoor: Large-size chiller, large electric motors, microwave, etc.
- Do not use this product in the environment where corrosive gas, such as ammonia and sulfurous acid gas, are generated. It may cause malfunction.
- Do not install in the area that cause salt damages. It may cause malfunction by paint peeling off or corrosion. When installing in the area with risk of salt damages, make sure to take following measures:

  1. Wrap the connector with self-fusing tape
  2. Change the fixing screw to bolt screw made of aluminum
  3. Run the cables in a plastic or metal pipe treated with salt-resistant paint such as molten zinc plating
  4. Periodically clean.
- Do not use this instrument in the vacuum environment.
- For proper grounding use the original cable provided.
- If the cable and sensor is in risk for getting damaged by birds and small animals, protect the cable and the sensor by using:

  1. Reflective tape
  2. Repellent
  3. Cable duct
  4. Installing bird-spike
- When using the configurable 0 to 1V output from UV radiometer, please use a precision resistor 100Ω.
- The settings can be changed with the RS485 / USB conversion cable and dedicated software.

2. Handling

- Be careful when handling instruments with glass domes. Strong impact to this part may damage the glass and may cause injuries by broken glass parts.
- When carrying any model with the sun screen attached, always hold the instrument from the bottom. Holding only the sun screen part may lead to dropping the sensor as it comes off from the sun screen.

3. Signal Cable

- Make sure to ground the signal cable. When grounding is insufficient, it may cause not only measurement error due to noise, but also cause electric shock and leakage accidents.
- Check the voltage and types of specified power supply before connecting this instrument. When improper power supply is connected, it may cause malfunction and/or accident.
- Use this instrument with 0.5A fuse connected to the power supply line in series. Without connecting the fuse, it has risks of generating heat and fire due to large-current flowing by the power supply when internal damage of the electronics occurs.

4. About RS485 Modbus connection

- This product supports communication through the RS485 Modbus RTU.
- It is recommended to use the optional EKO converter cable when connecting MS-10S/11S to a PC.
- Depending on the USB-RS485 converter type, an additional termination resistor (120Ω) and/or pull-up/pull-down resistor (680Ω) is required for proper communication.
- When connecting to a RS485 (Modbus) master peripheral device, an additional termination resistor (120Ω) and/or pull-up/pull-down resistor (680Ω) is required for proper communication.

EKO

IMPROTANT USER INFORMATION

CE

DECLARATION OF CONFORMITY

We: EKO INSTRUMENTS CO., LTD 1-21-8
Hatagaya Shibuya-ku, Tokyo 151-0072
JAPAN

Declare under our sole responsibility that the product:

Product Name: UV-A Radiometer, UV-B Radiometer
Model No.: MS-10S, MS-11S

To which this declaration relates is in conformity with the following harmonized standards of other normative documents:

Harmonized standards:
EN 61326-1:2021 ClassA (Emission)
EN 61326-1:2021 (Immunity)

Following the provisions of the directive:
EMC-directive : 2014/30/EU

Date : July 15 , 2025

Position of Authorized Signatory : General Manager of R & D Center

Name of Authorized Signatory : Hitoshi Yokemura

Signature of Authorized Signatory : Hitoshi Yokemura

CE

DECLARATION OF CONFORMITY

We: EKO INSTRUMENTS CO., LTD 1-21-8
Hatagaya Shibuya-ku, Tokyo 151-0072
JAPAN

Declare under our sole responsibility that the product:

Product Name : UV-A Radiometer, UV-B Radiometer

Model No. : MS-10S, MS-11S

To which this declaration relates is in conformity with the following harmonized standards of other normative documents:

Harmonized standards:

EN IEC 63000：2018. [RoHS]

Date : July / 17 / 2025

Position of Authorized Signatory : Director of Quality Assurance

Name of Authorized Signatory : Taiji Yamashita

Signature of Authorized Signatory : Taiji Yamashita

EKO Asia, Oceania
1-21-8 Hatagaya,
Shibuya-ku, Tokyo
151-0072 Japan
P. +81.3.3469.6711
F. +81.3.3469.6719
info@eko-instruments.com
www.eko-instruments.com

EKO North America
2570 North First Street,
Suite 200, San Jose,
CA 95131, USA
P. +1-408-977-7751
F. +1-408-977-7741
sales-usa@eko-instruments.com
www.eko-instruments.com

EKO Europe,
Middle East, Africa,
South America
Lulofsstraat 55, Unit 28,
2521 AL, The Hague,
The Netherlands
P. +31 [0]70 3050117
sales-eu@eko-instruments.com
www.eko-instruments.com